STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:

The Application for Certification for the
Calico Solar Project

Docket No. 08-AFC-13

INTERVENOR DEFENDERS OF WILDLIFE

REBUTTAL TESTIMONY

July 29, 2010

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Pursuant to the Committee's scheduling order dated July 13, 2010, Defenders of Wildlife provides the following rebuttal testimony for the Calico Solar Project evidentiary hearings scheduled for August 2010. The foregoing testimony concerns the Biological Resources topic area.

Defenders of Wildlife reserves the right to supplement or revise its testimony at any time up to and including the close of the evidentiary hearings.

REBUTTAL TESTIMONY OF JAMES. M. ANDRE

To the best of my knowledge, all of the facts contained in this testimony (including all referenced documents) are true and correct. I am personally familiar with the facts and conclusions described within this testimony and if called as a witness, I could testify competently thereto.

Qualifications

Serving as Director of the University of California's Granite Mountains Desert Research Center since 1994, I have been instrumental in developing the Center into one of the leading research and teaching facilities in the UC Natural Reserve System. I currently oversee more than 165 arid lands research projects at the Center, which is located in the Granite Mountains, approximately 40 miles east of the Calico Solar Project. I also serve as Curator of the Granite Mountains Herbarium, one of most comprehensive collections of California's desert flora.

My academic training is in plant ecology, conservation biology, and natural areas management. I am a recognized expert on the flora of the Mojave and Southern Great Basin Deserts, with 30 years experience conducting more than 200 focused floristic inventories throughout the desert southwest of California, Nevada, and Arizona. In addition to discovering several new species to science, I am author of several floras,

including *A Flora of the Mojave National Preserve*. I am currently working on floras of the Owens Valley and Schell Creek Range, and am editor on the 2nd Edition of the *Flora of the Northern Mojave Desert*. I am a technical reviewer for the forthcoming 2nd Edition of the Jepson Manual: Vascular Plants of California.

My current research focuses on plant taxonomy, population demographics of long-lived desert shrubs, conservation biology of rare plants, and restoration ecology (particularly systems impacted by livestock grazing and invasive species). I am quite familiar with the white-margined beardtongue (Penstemon albomarginatus), having conducted demographic studies (unpublished) of the occurrence at Pisgah since 1994. I addition to my research I have taught more than 20 university-level courses in plant taxonomy, plant ecology, field sampling theory, and natural history courses based out of UC Riverside, UNLV, UC Berkeley, UCLA, and CSU Humboldt. I have taught numerous advanced field workshops and training seminars in botany, including seven UC Jepson Workshops.

I was the program chair, keynote speaker, and session chair of the Mojave Desert Regional Session at the 2009 California Native Plant Society (CNPS) Conservation Conference. I organized the 2nd and 3rd Mojave Desert Science Symposiums held at U. of Redlands (2004) and UNLV (1999) which brought scientists, land managers and consultants together to discuss mutual collaborations. I am co-founder of Mojave Desert Chapter of the California Native Plant Society (CNPS), and have served as the Senior Advisor to the statewide CNPS Rare Plant Program (RPP) and Chair of the RPP Committee since 2008.

Statement

I have reviewed the project applicant's survey reports and the Staff Assessment and find them inadequate in several regards:

1. **The Applicant's Survey Methodology for White-Margined Beardtongue Failed to Capture All Occurrences on the Project Site.**

The white-margined beardtongue is a short-lived perennial herb which maintains a substantial soil seed bank as well surviving underground as a subterranean heterotroph (root/caudex) during dry years. Compared to the other three global occurrences (two in Nevada, one in Arizona), the lone California population that wraps around the north end of the Pisgah Lava Flow occurs in very low densities with approximately 4000 individuals widely scattered across the site. Even during average years of precipitation, such as experienced at the Calico site in 2010, a large percentage of the seed bank will not germinate and many living plants remain dormant underground. Only a subset of plants will put on above ground growth, and an even fewer number flower and set seed. Seed banks can persist in the soil for many decades before germinating.

Zitzer et.al (2008) showed that for Nevada occurrences during any year, a population in full bloom may be less than 10 km distant from another population that is surviving only

as underground dormant roots or seeds. Consequently, a difficult to measure fraction of *P. albomarginatus* genetic diversity remains buried for perhaps six or more years, based on 40 % germination of 6-year-old seed stored air-dried at room temperature.[1] Additionally, I have conducted long-term demographic monitoring at the Pisgah occurrence of white-margined beardtongue. Preliminary findings of my work suggest that California plants are not as long-lived as those in Nevada (Zitzer et. al (2008). I have observed and documented frequent localized extinctions of cohorts with rapid establishment of plants in previously unoccupied areas. Thus, plants at the California occurrence behave more like biennials or short-lived perennials, relying upon the maintenance of a viable seed bank, and over time exhibit a shifting distribution within the aeolian sands at the Calico/Pisgah site.

Because the majority of the population occurs underground, only a small portion of the overall viable distribution of the species onsite could be documented during surveys. The Applicant's surveys failed to consider soil seed bank and underground root/caudex dormancy in assessing the potential number and distribution of white-margined beardtongue individuals at the Calico site. The conclusions made in project applicant's survey reports and the Staff Assessment that most if not all of the white-margined beardtongue at the Calico site were documented during surveys are therefore significantly in error.

2. A Large Portion of the Proposed Site is Potential Habitat for the White-Margined Beardtongue.

In California, the white-margined beardtongue is limited to the fine alluvial sand (mostly north of Interstate 40) within a sparse creosote bush scrub vegetation community. The sand is deep and stabilized, holding the long taproot in place. A few scattered occurrences can also be found in the pockets of aeolian sands within the Pisgah lava flows to the south of I-40.[2] Both stabilized and more active aeolian sand deposits are common on the proposed Calico Solar project site.

Very few of the population occurrences that I have monitored over the past 15 years at Pisgah were observed during the years of the applicant's field surveys. Therefore, much of the site exhibits potential habitat conditions for white-margined beardtongue, within which above ground distributions are patchy in time and space, and shifting regularly.

BLM has limited incidental take of the white-margined beardtongue to 50 acres of occupied and potential habitat.[3] There is considerable evidence suggesting that there is

[1] Zitzer, S., King, J., and Etyemezian, V., 2008. *Unveiling the mysterious ecology of a rare relict Mojave Desert forb (Penstemon albomarginatus): Will ecological knowledge put a damper on exponential growth in Southern Nevada?* Report for 93rd Ecological Society of American Annual Meeting.
[2] Scogin, R. 1989. Studies of *Penstemon albomarginatus* in California. Report for Rancho Santa Ana Botanic Garden, Claremont, California.
[3] Bureau of Land Management, 2005. West Mojave Plan: A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment. California Desert District, Moreno Valley, CA.

far more than 50 acres of potential habitat for white-margined beardtongue on the project site.

3. The White-Margined Beardtongue in California Could Face Extinction Due to Direct and Cumulative Impacts Within its Limited Range.

In California, a freeway, a powerline, and three pipelines cross the small area in which the white-margined beardtongue occurs. In addition to these existing threats and alterations, the 8,230-acre Calico Solar Project and other renewable energy projects proposed in the Pisgah region would severely limit the white-margined beardtongue's habitat and ability to survive.

The Calico Solar Project will deploy heliostats, power towers, associated building structures, pipelines, and roads across a relatively intact desert ecosystem, where naturally functioning ecological processes still predominate over recent man-made intrusions. The completed project footprint will fragment more than 8,000 acres of desert vegetation community, including the white-margined beardtongue population, into fragments of various size. The biological affects of ecosystem fragmentation are well documented (Saunders et al., 1991). In general, the fragmentation of rare plant habitat on the project site will lead to two fundamental changes to white-margined beardtongue across the landscape; 1) an increasing isolation of remnant populations, and 2) a decrease in the total amount of available habitat for remnant populations. These two phenomena will be repeated throughout the project area under footprints of proposed neighboring energy projects, and throughout tens of thousands of acres of the greater Mojave Desert where hundreds of utility-scale wind and solar project applications are being reviewed in California, Nevada, and Arizona.

To manage for viable rare plant populations, it will be necessary to identify project-related threats to those populations. In general, threats come in three types 1) threats imposed by changes in the environment, either by natural or human causes, 2) threats resulting from disturbance of important interactions with other species, and 3) genetic threats. With so many threats it is difficult to understand how each may ultimately affect the viability of specific plant populations or metapopulations, how to untangle their interaction with other threats, and how to come up with effective methods to alleviate them.

Fragmentation (e.g., roads, heliostat fields, structures) of important habitat for white-margined beardtongue survivability caused by development of the proposed Calico Solar project, and other subsequent energy projects proposed for the Pisgah region, will have serious impacts, but how exactly? Plant conservation biology theory has taught us that if larger populations are broken into smaller ones it leads to restricted exchange of pollen or seed, and this has important genetic and demographic consequences. But fragmentation also creates edge effects and deterioration of habitat quality. It may alter plant-pathogen and plant-herbivore dynamics and disrupt biotic interactions that might include destruction of key pollinator guilds, altered pathogen and herbivore interactions, and hybridization with introduced natives (e.g., revegetation programs).

Due to lack of time, funding or available expertise, the full range of demographic vs. genetic stochasticity parameters are rarely integrated into a population viability analysis. Until such detailed analyses become available, we must strive to maintain natural ecological processes and provide the best natural conditions for populations and metapopulations to persist, while delineating the most likely threats and minimizing or eliminating them where possible.

Current environmental threats to the proposed Calico Project site and surrounding lands are considerable. In order to fully assess impacts to the white-margined beardtongue by the proposed Calico Solar project, it is imperative to fully understand this species distribution onsite (including below ground signatures), its life-history attributes, and identify any threats to the viability of the population. Given the location, scale and the nature of disturbance proposed by the Calico project, it is my professional judgment that the project poses a serious threat of extinction to the lone California occurrence of this species.

4. **The Proposed Minimization 250-foot Buffer Does Not Sufficiently Minimize Impacts to the White-Margined Beardtongue Nor Maintain the Species' Viability.**

California Energy Commission staff has proposed a 250-foot buffer around each plant to minimize the project's impact (*See* DEIS, C.2-55). Enclosing the few above-ground occurrences (the "halo" method) ignores what we know about the biology of the species, as well as the importance of maintaining the population processes over the species' critical habitat. The "halo" plan is fraught with obstacles to the long-term success of self-sustaining plant populations as is detailed in point # 3 above.

The Committee should not consider the 250-foot buffer zone as "avoidance" or as an on-site mitigation measure that will result in long-term, self-sustaining populations of rare plants. Mitigation practices certified on this project will be precedent-setting for subsequent project applications and should be based on sound scientific information. The extent of protection afforded to plants within isolated halos remains speculative at best. Preserving intact habitat and connectivity with surrounding areas are inherent to the most basic principles of conservation biology. To maintain viable populations of white-margined beardtongue it is crucial to preserve the intact nature of the current, pre-project condition with the rest of the undeveloped Calico/Pisgah sand system. The difficulties in deciding if and how to avoid, minimize, and mitigate project impacts become moot when one considers turning to the alternatives of distributed photo-voltaic solar generation and utility-scale projects sited on low-impact lands to provide the MW of electricity that the Calico Solar project would produce.

5. **Rare Plant Surveys Lacked Late Summer/Early Fall-Flowering Taxonomic Inventory**

Each species requires its own unique conditions for growth and reproduction. Surveys,

no matter how thorough, performed during seasons and years when specific growth conditions are lacking will miss the presence and/or full range extent of rare plants. I estimate that approximately 25% of the plant taxa at the project site reach their peak reproductive maturity in late summer/early fall. A number of these potentially-occurring taxa are special status plants that flower primarily in summer/fall.

The floristic surveys conducted by the applicant to through 2010 (to date) were reasonably thorough to capture both early and late spring-flowering species. These surveys were also performed by well-qualified field personnel. However, floristic surveys for desert rare plants must be performed over a number of years during both spring and summer/fall flowering seasons in order to maximize the probability of identifying all special status species with the potential to occur on the project site. Without an accurate inventory of plant taxa that occur on site, it is not possible to fully assess project impacts to special status plants and meaningful mitigation cannot be developed.

What is more, the Eastern Mojave is a botanical frontier where in the past few years alone, there have been a number of very significant botanical finds, including new species to science or to California. More discoveries are to be expected. Summer annuals and fall-flowering species represent perhaps the most underdocumented group of plants in the California Deserts. Since summer/fall surveys have yet to be performed at the project site, there is no baseline information on the presence and extent of these taxa. Therefore, summer/fall surveys need to be conducted throughout the entire site (following adequate precipitation) in order to obtain a full account of special status species on site.

Below is a partial list of special status plants that flower primarily in late summer/early fall and that have potential to occur at the Pisgah/Calico site. This list was compiled from CNDDB records, herbarium records, and from my professional experience working with each species.

Amaranthus watsonii
Chamaesyce abramsiana
Chamaesyce parryi
Chamaesyce revoluta
Matelea parvifolia
Muhlenbergia appressa
Munroa squarrosa
Physalis lobata
Portulaca halimoides
Salvia funerea

6. Project Destroys One of the Last Ecologically Functional Examples of Central Mojave Desert Ecosystem.

The proposed Calico Project is located in the heart of California's Mojave Desert, at a place where the western Mojave transitions into the eastern Mojave Desert. Much of the

central and western Mojave Desert is impacted by encroaching human activities and development. Encircled by the Kelso Dunes Wilderness and the Bristol Mountains Wilderness on the east, and the Cady Mountains Wilderness Study Area to the north, the Pisgah/Calico region is part of the most expansive and viable examples of pristine central Mojave Desert ecosystem. It represents one the last remaining sanctuaries for hundreds of vascular plant species unique to the central Mojave Desert floristic region. Direct and indirect impacts associated with the proposed Calico Project will further deteriorate the ecological integrity of the larger central Mojave Desert ecosystem.

7. **The Calico Solar Project is Precedent-Setting, Will Irreversibly and Negatively Impact Intact Wildlands, and a Statement of Overriding Considerations Should not be Issued.**

The Calico Solar project has the potential to become one of the first examples of transformative energy generation practices in California, in terms of both scale and technology. Unfortunately, the applicant has chosen an ecologically high-impact location for this project. In good faith, the applicant has responded by developing, at great expense, high quality (though still incomplete) botanical surveys, and special-status plant mitigation plans in addition to extensive animal mitigation, and engineering plans. The challenges associated with reviewing the project's application for certification have been extensively discussed and reported, and should be met with equally transformative decision making.

I endorse the concept of State and Federal governments making an example of this project by calculating the amount the applicant has expended on site planning thus far, and applying those funds as a joint state and federal credit to the applicant toward obtaining a right of way on public lands or the purchase of private lands elsewhere on ecologically low-impact lands. This would thereby provide the means and incentives to relocate the project to a less damaging location, while establishing the precedent for what types of lands are and are not suitable for utility-scale renewable energy generation. This type of solution honors the economic and political expenditures of the applicant and others involved in the certification process, while recognizing that the preservation of ecosystem is paramount to all discretionary actions. The Commissioners must consider and make sustainable management decisions that are firmly grounded on science-based ecological principles and that recognize the inherent value of the landscapes that contain the structures, composition and processes that support and enhance biodiversity, heterogeneity and complexity. As the decision-making body for this and subsequent utility-scale solar energy projects, the Commission becomes our representative to future generations. If the decision is to build the project as proposed by relying on mitigation concepts with no scientific foundation, and on statements of overriding consideration, then we will have set a very low bar for how our generation chooses to transform how we generate energy while cohabiting the planet, and will have hastened the type of ecological destruction for which the Calico Solar project is meant to mitigate.

James M. Andre

Curriculum Vitae

EDUCATION

M.A. Botany, 1989, Humboldt State University, Arcata, CA.
Thesis: *Population Biology and Conservation of Abronia alpina in the Southern Sierra Nevada, Inyo County*.
B.A. Plant Ecology/Geography of Ecosystems, 1982, University of California, Los Angeles

RESEARCH INTERESTS

Rare plant conservation biology and recovery, vascular plant floristics (western U.S.), demographics of long-lived desert shrubs, alpine ecology, vegetation analysis and classification, species distribution ecology, invasive plants, vegetation dynamics of coastal and interior dunes, and impacts and restoration ecology (particularly in systems impacted by livestock grazing).

PROFESSIONAL EXPERIENCE

1993-present	Director, University of California's Sweeney Granite Mountains Desert Research Center
2008-present	Senior Advisor and Chair, California Native Plant Society Rare Plant Program
1995-present	Curator, GMDRC Herbarium
1997-present	Adjunct professor, Lecturer, University of California Riverside
1985-present	Independent Consultant. Clients include Southern Nevada Water Authority, Native American Land Conservancy, Southern California Edison; Bureau of Land Management; Dept. of Defense; Los Angeles Dept. of Water and Power; US Forest Service, USFWS, BLM, National Park Service; The Nature Conservancy; Counties of San Diego, Inyo, Humboldt and Stanislaus; FAA, California Native Plant Society, East Bay Municipal Water District.
1989-1993	Senior Plant Ecologist, BioSystems Analysis, Inc, Tiburon, CA.
1987-1989	Research Associate - Plant Ecologist, Humboldt State University
1983-1989	Forest Botanist, U.S. Forest Service, Inyo National Forest
1986-1987	Teaching Assistant, Humboldt State University
1982-1983	Research Assistant, San Diego State Univ. (vernal pools studies)
1981-1982	Preserve Manager, Ewing Oak Preserve, The Nature Conservancy, San Diego Co.
1979-1980	Botanist/Ornithologist, National Park Service, Santa Monica Mountains National Recreation Area.

BOTANICAL RESEARCH AND INVENTORY

- awarded more than 25 academic research grants (ex. National Science Foundation, Smithsonian) and 40 government agency research contracts, managing grant budgets ranging from $500 to $8,100,000.

- oversee and facilitate 165 current multi-disciplinary research projects affiliated with the UC Granite Mountains Desert Research Center.

- principal investigator on more than 100 academic research projects in the California and Nevada deserts since 1994.

- lead author on numerous published regional floras and annotated vascular plant checklists, including floras for the Owens Valley, Mojave National Preserve, Big Pine Canyon, Dead Mountains, Old Woman Mountains, Ash Meadows Natl. Wildlife Refuge, and Schell Creek Range.

- conducted over 400 floristic inventories in the desert southwest since 1979 (full list available upon request, some examples included below).

- principal investigator conducting comprehensive studies in population ecology, demographics and threats analysis to evaluate conservation status for more than 100 California rare plants (full list available upon request). Examples include *Abronia alpina, Erysimum menziesii, Pogogyne abramsii, Eriogonum thornei, Penstemon albomarginatus, Plagiobothrys parishii*and *Eriophyllum mohavense*.

- directed (ongoing) the Flora of the Mojave National Preserve Project, a floristic study of the 1,700,000 acre Mojave National Preserve and surrounding 500,000 acres. Included 7000 hours of field surveys, published annotated checklist of plants, compiled database of records submitted to NPSpecies national database; illustrated technical flora (book) is pending.

- conducted numerous large-scale floristic inventories including the 2 million-acre Golden Trout Wilderness, 800,000 acre Joshua Tree National Park (NPS), 900,000 acre Owens Valley survey, and 500,000 acre 20 Palms Marine Corps Base (DOD).

- principal investigator on 3 year project develop rare plant status reviews for 8 federally-listed species at Ash Meadows National Wildlife Refuge, Nye Co. Nevada.

- project manager of the DOD Legacy Program coastal dunes ecological study which included population studies and habitat analyses of four rare plant species on the coastal dunes and bluffs at USMC Camp Pendleton, CA.

- conducted rare plant surveys for 845-mile PG&E-PGT Pipeline from Alberta to Fresno, the 275-mile Tuscarora Pipeline Project from Reno to Malin, Oregon and the 384-mile Mojave Pipeline Project from Needles to Bakersfield. For the later project, developed and implemented rare plant and vegetation restoration, long-term monitoring, and evaluated 10-year post-construction success of restoration measures.

- 15 yrs experience as Curator of the University of California- Granite Mountains Herbarium.

- conducted inventory and mapping of more than 100 seeps and springs (40,000 acres) as part of the Lower Owens River Project, Inyo County, CA. Developed demographic monitoring and impact studies on Inyo County star-tulip (*Calochortus excavatus)* and Owens Valley checkerbloom (*Sidalcea covillei*).

- principal investigator of a 90,000 acre floristic inventory and vegetation analysis of the Old Woman Mountains Preserve, eastern San Bernardino County for the Native American Land Conservancy.

- conducted detailed impacts surveys and population analyses for several federal-listed species in Cushenberry Cyn, San Bernardino Co., including Parish's daisy (*Erigeron parishii*), Cushenberry buckwheat (*Eriogonum ovalifolium vineum*), and Cushenberry milkvetch (*Astragalus albens*).

- conducted complete floristic inventories and rare plant surveys along approximately 110 miles of pipeline corridors in the Virgin River area of eastern Clark County, Nevada (Southern Nevada Water Authority).

- principal investigator for botanical surveys for more than 400-miles of proposed water pipeline corridors in White Pine, Lincoln and Clark Counties of Nevada (Southern Nevada Water Authority).

- consulted for numerous interdisciplinary projects on the design and implementation of optimal field sampling protocol, including riparian vegetation/habitat monitoring on the upper Sacramento River as part of a study of the impacts of the Cantara Bridge chemical spill. Provided expert testimony in federal court on research findings.

- conducted more than 30 quantitative vegetation classifications employing ARCGIS, TWINSPAN, DECORANA, and PCA other multivariate software programs. Examples include:
  - riparian vegetation analysis of tributary streams (Bishop and Mill Creeks) of the Owens River employing multi-stage sampling protocols and vegetation monitoring (using a laser theodolite) to determine the effect of changes in stream flow on riparian systems (SCE);
  - characterization and mapping of vegetation at Tonto Creek, AZ for long-term monitoring of change (BOR);
  - characterization and mapping of riparian and meadow vegetation on the Kern Plateau for purpose of monitoring grazing and erosion impacts (USFS);
  - multi-stage classification and monitoring of riparian forest and woodlands along Sacramento and Stanislaus Rivers to monitor affects of alteration of flow regimes upstream (EBMUD);

- Twinspan and PCA classification of vegetation along Eel and Mad Rivers of Humboldt Co. (USFS);
- classification and mapping of vegetation series and associations of vernal pools and swales in central Sacramento Valley, CA.;
- long-term monitoring and classification of vegetation on desert riparian thicket and tamarisk-invaded streams and seeps in the Mojave Desert.

- designed a vegetation classification scheme and reviewed field protocols and data collections for the Mojave Desert Mapping Project (CDFG and DOD, 1998-1999).

- documented vascular plant composition for vernal pools in seven counties in the Sacramento Valley using relevé sampling; assessed temporal changes in species composition and hydrology in the Kearny Mesa vernals pools of San Diego County; developed conservation management for more 8 rare plant taxa, addressing recovery, enhancement, and long-term viability of the species.

NATURAL AREAS MANAGEMENT

- 20 years of experience as a leader in coordinating academia research and regional natural areas management among scientists and agency managers in the Eastern Mojave Desert.

- served as Principal on Inventory and Monitoring Committee to develop protocols for the National Park Service I & M Program - Desert Southwest Region. Provided data and participated in the writing of the National Park Service's Mojave Inventory and Monitoring Network Biological Inventory Study Plan (2001).

- coordinated the writing of a Cooperative Management Agreement between the University of California and the National Park Service for joint management of lands within the Mojave National Preserve.

- served on numerous academic and land management committees including the Desert Advisory Committee (congressional appointment) Science Data Management Interagency Working Group for the Desert Managers Group, Center For Conservation Biology at UC Riverside, Research Advisory Committee - Mojave National Preserve, and the Advisory Council to the California Wild Heritage Campaign, and California Native Plant Society Rare Plant Committee (Chair).

- developed a comprehensive Coastal Dunes Vegetation Management Plan for the 13-mile coastal beach and dune system at Camp Pendleton, California. Study included the development of vegetation monitoring plan, GIS ARC/INFO quantitative habitat mapping, Least Tern and Snowy Plover habitat enhancement, and implementation of rare a plant and dunes recovery and enhancement program (exotic species removal and establishment of native vegetation).

- designed and implemented long-term monitoring for 12 rare plant species in Inyo and eastern San Bernardino Counties to assess the effects of grazing impacts on population dynamics.

- conducted long-term monitoring of special-status plants and vegetation recovery following disturbance in numerous study sites throughout the East Mojave in collaboration with the California and Nevada Native Plant Societies.

- coordinated numerous exotic species control/removal programs including a 7 year study of tamarisk removal along 16 streams in the east Mojave Desert using repeated physical removal and systemic injection of Garlon.

- drafted a Resource Management Plan with the National Park Service for joint management of the federal lands within the Sweeney Granite Mtns Desert Research Center, including removal of exotic burros and plants, erosion control and habitat restoration and enhancement (ongoing).

- developed long-term vegetation and habitat management plans for the Native American Land Conservancy's Old Woman Mountains Preserve.

- developed an illustrated technical manual detailing techniques for high elevation meadow restoration on the Inyo National Forest.

- drafted vegetation management sections of the Inyo National Forest Plan at USDA Forest Service; prepared seven sensitive plant Species Management Guides;

- supervised 10-15-person backcountry crews to evaluate the success of restoration and revegetation of montane meadows in the southern Sierra Nevada degraded by livestock grazing.

- developed a long-term vegetation management plan for Inyo National Forest and coordinated sensitive plant inventory and monitoring.

- conducted a 3-year programmatic botanical assessment for East Bay Municipal Water District's Water Supply Management Program and EIR/EIS, including impact assessment of for 52 proposed reservoir sites and 14 aqueduct corridors in the Central Valley and western Sierra Nevada foothills.

- prepared a comprehensive Hardwoods Management Plan for County of Contra Costa, California.

TEACHING, PRESENTATIONS, CONFERENCE ORGANIZATION

- session chair for more than 20 major workshops and conferences, including the 2009 CNPS Conservation Conference, 2009 Desert Research Symposium, 2004 and 1999 Mojave Desert Science Symposiums.

- co-architect and lead organizer of the Desert Research Symposium and Mojave Desert Science Symposium series.

- developed curricula and taught over 20 university-level field courses or workshops in botany and plant ecology and desert ecology at the Granite Mountains Desert Research Center; taught 9 accredited college courses (including: Humboldt State Univ., UCLA, UC Berkeley, San Diego St. University) in plant ecology and vegetation sampling theory.

- instructor for more than 15 plant taxonomy field courses for the Jepson Herbarium Workshops, Joshua Tree Foundation, and Rancho Santa Ana Botanical Garden; taught numerous field courses in natural history for the Sierra Institute, California Native Plant Society, and Victor Valley College.

- presented over 150 lectures/presentations at university departmental seminars, agency workshops, and scientific conferences, including the opening speaker at the 2009 Southern California Botanists Symposium.

- published a fully-illustrated Ethnobotanical Guide to the Plants of the Old Woman Mountains, an educational guide book along with other educational materials for the Native American Land Conservancy's Old Woman Mountains Preserve.

- developed public education programs which included docent-led field trips and slide presentations for the Ewing Oak, Lanphere-Christensen Dunes Preserves, and Old Woman Mountains Preserves.

SCIENTIFIC REVIEW AND ACADEMIC COMMITTEES

- reviewed numerous academic books including the forthcoming ***The Jepson Manual, Higher Plants of California 2nd Ed*** and sections of the ***Flora of North America***.

- peer-reviewed more than 30 refereed journal submissions and technical papers for Journal of Arid Environments, J. of Ecology, Ecol. Monographs, J. of Conservation Biology, Crossossoma, Madrono, Novon, Fremontia, and USGS, USDA Forest Service and USDI Park Service publications.

- served three years on UC Natural Reserve System's Mildred E. Mathias grant selection committee to evaluate proposals and award University of California graduate research grants to student researchers.

- initiated the establishment of graduate student research grants, including the California Desert Research Fund (Riverside Community Foundation) and Joshua Tree National Park Graduate Student Research Grant; served on selection committee for both grants over the past decade.

- reviewed or prepared technical sections for EIRs/EISs, Biological and Environmental Assessments, FERC Exhibit E's, agency mitigation plans, and numerous endangered species and resource management plans.

- NRS representative (2 year appointment), UC Office of the President Universitywide Advisory Committee

- drafted or reviewed more than 20 federal and state and federal listing petitions (for CDFG, USFWS and CNPS) for listing of rare California and Nevada plant species.

PUBLICATIONS AND TECHNICAL REPORTS

Andre, J. and T. La Doux. 2010. The Sweeney Granite Mountains Desert Research Center. In, *Fiat Natura: The University of California Natural Reserve System*, Susan G. Rumsey and Peggy Fieldler Eds. UC Press.

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Andre, J. and F.J. Smith. A revised checklist of vascular plants in Ash Meadows National Wildlife Refuge. Technical Report, Dept. of Interior USFWS.

Andre, J. 2007. Effects of Hackberry Fire on 10 special-status species in the Mojave National Preserve. Dept. of Interior, National Park Service. Technical Report ESR 8.3.6.

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Andre. J. and E. McDonald. 2004. Ecosystem Monitoring: Linking Ecosystem Attributes to Ecological Processes; Summary and Discussion. In proceedings to the 2nd Mojave Desert Science Symposium, Univ.of Redlands, CA.

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Andre, J. and J. Goerrissen. 2005. Proceedings from the 25th Anniversary Symposium of the UC Granite Mountains Desert Research Center. UCR Press.

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PROFESSIONAL AFFILIATIONS

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Botanical Society of America (BSA)
Society for Ecological Restoration (SER)
Natural Areas Association (NAA)
Society for Conservation Biology (SCB)
Ecological Society of America (ESA)
California Native Plant Society (Mojave and Bristlecone Chapters)
Nevada Native Plant Society (Las Vegas Chapter)
Southern California Botanists Association
Desert Legume Program, University of Arizona
California Exotic Pest Plant Council
Union of Concerned Scientists

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:

The Application for Certification for the
Calico Solar Project

Docket No. 08-AFC-13

INTERVENOR DEFENDERS OF WILDLIFE

DECLARATION OF JAMES M. ANDRE

I, James M. Andre, declare as follows:

1. I am Director of the University of California's Granite Mountains Desert Research Center.

2. I hold a Master's degree in Plant Ecology. My relevant professional qualifications and experience are set forth in the attached testimony and are incorporated herein by reference.

3. I prepared the testimony attached hereto and incorporated herein by reference, relating to the biological resource impacts of the proposed Calico

4. It is my professional opinion that the attached testimony is true and accurate with respect to the issues that it addresses.

5. I am personally familiar with the facts and conclusions described within the attached testimony, and if called as a witness, I could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct and that this declaration was executed

At: UC Granite Mountains Desert Research Center

On: July 24, 2010

Signature: James M. Andre

DECLARATION OF SERVICE

I, Joshua Basofin, declare that on July 29, 2010, I served and filed copies of the Attached:

1. Defenders of Wildlife's Prehearing Conference Statement
2. Rebuttal testimony of James M. Andre
3. Declaration of James M. Andre
4. Rebuttal testimony of Jeffrey B. Aardahl
5. Declaration of Jeffrey B. Aardahl
6. Application for Subpoena of a CDFG Representative
7. Declaration for Application for Subpoena

The original documents, filed with the Docket Unit, are accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[www.energy.ca.gov/sitingcases/calicosolar]**. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

_X_ sent electronically to all email addresses on the Proof of Service list;

_X_ by personal delivery or by depositing in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

_X_ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

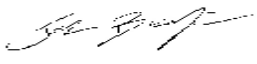
OR

___ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-13
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.



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BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION

For the CALICO SOLAR (Formerly SES Solar One)

Docket No. 08-AFC-13

PROOF OF SERVICE
(Revised 7/12/10)

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